

**PETITION FOR REVIVAL OF AN APPLICATION FOR PATENT  
ABANDONED UNINTENTIONALLY UNDER 37 CFR 1.137(b)**

First named inventor : Yoon-Deuk Seo

Group Art Unit: Not Assigned

International App. No.: PCT/KR00/01082

International Filing Date: September 28, 2000

Title : VOICE RECORDING  
APPARATUS, VOICE  
CARD, AND METHOD FOR  
RECORDING VOICE BY  
USING THEM

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620.00 OP

Examiner : Not Assigned

RECEIVED

18 OCT 2001

Legal Staff  
International Division

Assistant Commissioner for Patents  
Washington, D.C. 20231

ATTN: Box DAC

The above-identified application became unintentionally abandoned for failure to timely comply the requirements set forth in 35 U.S.C. § 371 (c). The abandonment date of this application is August 14, 2001 (i.e., the day after the last date for complying with the requirement).

APPLICANT HEREBY PETITIONS FOR REVIVAL OF THIS APPLICATION

1. Petition fee

Small entity - fee \$620

2. Proposed response and/or fee

The national fee of \$518 and request for entry into the national phase of the international application with accompanying documents are enclosed herewith.

3. Verified statement that delay was unintentional


The delay in complying with the requirements referred to above was unintentional.

- (X) Please charge any additional fees or credit overpayment to Deposit Account No. 11-1410.
- (X) Return prepaid postcard.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: 8/31/01

By: 

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International Application No.  
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Attorney Docket No.  
GIPPL2.001APC

Date: August 31, 2001

09/914829 Page 1

**TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US)  
CONCERNING A FILING UNDER 35 USC 371**

International Application No.: PCT/KR00/01082  
International Filing Date: September 28, 2000  
Priority Date Claimed: December 13, 1999  
Title of Invention: VOICE RECORDING APPARATUS, VOICE CARD, AND METHOD FOR  
RECORDING VOICE BY USING THEM  
Applicant(s) for DO/EO/US: Yoon-Deuk Seo

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. (X) This is a **FIRST** submission of items concerning a filing under 35 USC 371.
2. (X) This express request to begin national examination procedures (35 USC 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 USC 371(b) and PCT Articles 22 and 39(1).
3. (X) Petition For Revival Of An Application For Patent Abandoned Unintentionally Under 37 CFR 1.137(b), with petition fee.
4. (X) A copy of the International Application as filed (35 USC 371(c)(2))
  - a) () is transmitted herewith (required only if not transmitted by the International Bureau).
  - b) (X) has been transmitted by the International Bureau.
  - c) () a copy of Form PCT/1B/308 is enclosed.
  - d) () is not required, as the application was filed in the United States Receiving Office (RO/US).
5. (X) Amendments to the claims of the International Application under PCT Article 19 (35 USC 371(c)(3))
  - a) () are transmitted herewith (required only if not transmitted by the International Bureau).
  - b) () have been transmitted by the International Bureau.
  - c) () have not been made; however, the time limit for making such amendments has NOT expired.
  - d) (X) have not been made and will not be made.
6. (X) Eight (8) pages of formal drawings.
7. (X) A substitute specification. No new matter has been added in the substitute specification.
8. (X) International Application as published.
9. (X) The present application qualifies for small entity status under 37 C.F.R. § 1.27.
10. (X) A return prepaid postcard.

09/914829

U.S. Application No.  
Unknown

International Application No.  
PCT/KR00/01082

Attorney Docket No.  
GIPPL2.001APC

Date: August 31, 2001

JCO3 Rec'd PCT/PTO 31 AUG 2001  
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11. (X) The following fees are submitted:

				FEES
<b>BASIC FEE</b>				\$1,000
<b>CLAIMS</b>	<b>NUMBER FILED</b>	<b>NUMBER EXTRA</b>	<b>RATE</b>	
Total Claims	22 - 20 =	2 ×	\$18	\$36
Independent Claims	2 - 3 =	0 ×	\$80	\$0
Multiple dependent claims(s) (if applicable)			\$270	\$0
<b>TOTAL OF ABOVE CALCULATIONS</b>				\$1,036
Reduction by 1/2 for filing by small entity (if applicable). Verified Small Entity statement must also be filed. (NOTE 37 CFR 1.9, 1.27, 1.28)				\$518
<b>TOTAL NATIONAL FEE</b>				\$518
<b>TOTAL FEES ENCLOSED</b>				\$1,138
amount to be refunded:				\$0
amount to be charged:				\$0

12. (X) The fee for later submission of the signed oath or declaration set forth in 37 CFR 1.492(e) will be paid upon submission of the declaration.
13. (X) A check in the amount of \$1,138, of which \$620 is for petition to revive, is enclosed.
14. (X) The Commissioner is hereby authorized to charge only those additional fees which may be required, now or in the future, to avoid abandonment of the application, or credit any overpayment to Deposit Account No. 11-1410.

**NOTE:** Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

John M. Carson  
Reg. No. 34,303  
Customer No. 20,995

GIPPL2.001APC

PATENT

**VOICE RECORDING APPARATUS, VOICE CARD, AND METHOD FOR  
RECORDING VOICE BY USING THEM**

Field of the Invention

[0001] The present invention is related to a voice card in which voice is recorded and the recorded voice is played. Especially, the voice card of the present invention records voice using a separate terminal to make voice card simple and easy to order and deliver it at the remote.

Background of the Invention

[0002] A voice card is an apparatus for recording user's voice to the memory and for playing recorded voice. In other words, a user can record his voice to the voice card and deliver it to another person. The person who received the voice card can play user's voice recorded in the voice card.

[0003] Fig. 1 shows the conventional voice information recording method to the voice card and the constitution of the voice card. Fig. 1a illustrates the conventional manufacturing method of voice card, and Fig. 2 illustrates the constitution of the conventional voice card respectively.

[0004] As shown in Fig. 1a, there is no separate apparatus for manufacturing voice card. User's voice information without pre-processing is directly put into the voice card. The volume of the voice information of the user without pre-processing has an infinite variety, so the voice information should be processed to have an appropriate volume when it is played.

[0005] Conventional voice card should have a volume-adjusting unit 14 for adjusting the volume of the user's voice signal in addition to a play/record selection unit 11, a voice storage unit 12 and an output unit 13. The volume-adjusting unit 14 adjusts the volume of the user's voice signal which is not pre-processed, and put it out to the analog signal input terminal of the voice record unit 12.

[0006] Meanwhile, in case of using commercially purchasable IC chip (ChipCorder Series of ISD, Voice IC of OKI), which is comprised of single chip being able

to record an analogue voice signal, as a voice storage unit 12 in the conventional voice card, a voice signal without pre-processing is put into via MIC-IN terminal; volume-adjusted in the IC chip; input again via the Analog-In terminal of the IC chip after the signal went out of the first output terminal of the chip; and recorded in a storage unit of the IC chip. In this process, passive devices such as resistance and capacitor are needed between the Analog-In terminal and the first output terminal in order to put the volume adjusted analog signal out of the first output terminal into the Analog-In terminal of the IC chip.

[0007] The passive devices make the circuit area of the voice card large as well as complicate the manufacturing process, which cause the increase of production cost.

[0008] Since there is no separate unit to record a voice signal in the conventional voice card as shown in fig 1, it should use power of itself when it records the voice signal to the voice card. Generally, the voltage condition for recording a signal is severer than the one for playing it. When one uses the IC chip mentioned above, for example, 4.5V is enough to play the recorded voice signal while 6.0V to record it. Since the conventional voice card uses the power of itself in recording of which operation condition is rather severe, the power of large capacity will be used in it. Again, the production cost increases due to the large capacity power unit, which is, moreover, exhausted rather quickly.

[0009] In the conventional voice card, as shown in the fig 1, it is not easy to record user's voice remotely so that extra resources will be spent on the delivery of the voice card when the manufacturer is separated from the user. The order process, in which a customer records his (her) voice remotely and has it delivered to a designated receiver, and the delivery process of the recorded voice card needs to be improved.

[0010] Considering that it is unlikely to record the voice signal again other than what is recorded when a user get the voice card from the manufacturer, the conventional voice card without a separate voice recording unit occurs several problems such as the large power capacity, the difficulties of remote order and delivery, and the unnecessary demand for the passive devices for the volume adjustment.

#### Summary of the Invention

[0011] In light of the foregoing, it is an object of the present invention to provide voice card and voice recording apparatus for recording voice to the voice card which is cost-

**[0013]** It is yet another object of the present invention to provide improved voice card and voice recording apparatus which is easy to order remotely and to delivery to the receiver.

**[0015]** According to another aspect of the present invention, the apparatus for recording voice information signal further comprises an input means for inputting control signals to the controller.

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[0017] The controller performs the step of: (a) controlling the ARS memory and the telephone signals transceiver, in response to inputting a first control signal via the input means, to output the first voice message which is recorded in the ARS memory using the telephone signals transceiver; (b) waiting for the predetermined dial tone to be received by the telephone signal transceiver for the first period; (c) controlling the ARS memory and the telephone signal transceiver, in response to the predetermined dial tone being received by the telephone signal transceiver, to output the second voice message to the telephone line through the telephone signal transceiver; (d) controlling the telephone signal transceiver to generate a signal corresponding to the first confirmation sound and output the first confirmation sound to the telephone line through the telephone signal transceiver; (e) waiting for the second period; and (f) recording the voice information signals extracted from the telephone signals which is transferred from the telephone line through the telephone signal transceiver to the memory means of the voice card.

[0018] According to another aspect of the present invention, a voice card for storing and playing voice is provided. The voice card comprises: an interface means for transferring and receiving control signals and voice information signals from and to the external voice recording apparatus; memory means for storing, in response to the control signals, voice information signals which is put into the interface means; voice play switch; and voice playing means for transforming, triggered by the voice play switch, the voice information signals stored in the memory means and outputting the transformed voice information signals.

#### Brief Description of the Drawings

[0019] Fig. 1 is a block diagram showing the conventional method for recording voice information to the voice card and constitution of the conventional voice card.

[0020] Fig. 2 is a block diagram illustrating the method of recording voice information to the voice card according to the present invention.

[0021] Fig. 3 shows the constitution of the voice recording apparatus for recording voice information signal to the voice card according to the present invention.

[0022] Fig. 4 shows the constitution of the voice card in which voice can be recorded using the voice recording apparatus according to the present invention.



[0023] Fig. 5 is a flowchart illustrating the process of recording voice information signals to the voice card according to the present invention.

[0024] Fig 6 shows the situation that the voice recording apparatuses and voice cards of the present invention are equipped to both the sender and the receiver.

[0025] Fig. 7 shows the process of transferring and recording the voice information signals according to the present invention from the voice recording apparatus of the sender to the voice recording apparatus of the receiver.

[0026] Fig. 8 shows the process of transferring and recording the voice information signals according to another embodiment of the present invention from the voice recording apparatus of the sender to the voice recording apparatus of the receiver.

[0027] Figs. 9 – 11 show a perspective view, a front view and a rear view of the voice card according to an embodiment of the voice card respectively.

#### Detailed Description of the Preferred Embodiments

[0028] The method of recording voice information signals to the voice card using the voice recording apparatus according to the present invention will now be discussed with reference to the accompanying drawings.

[0029] Fig. 2 illustrates a method of recording voice information signals to the voice card using the voice recording apparatus according to the present invention.

[0030] As shown in Fig. 2, a method of recording voice information signals to the voice card using the voice recording apparatus according to the present invention utilizes a voice recording apparatus 21 which is separate from the voice card 22. More specifically, according to the present invention, the voice recording apparatus 22 is provided with a connecting port for connecting a voice card 22 in a manner that the voice card 22 is removable from the connecting port. First, a voice card 22 is connected to the connecting port of the voice recording apparatus 21. Then, the voice recording apparatus 21 receives the voice information signals from the client, adjusts the volume of the received voice information signals, and records the voice information signals to the voice memory of the voice card 22. After recording the voice information signals from the client to the voice card 22, the voice card 22 is separated from the voice recording apparatus 21 and transferred to



detector 303 for detecting DTMF signals among signals received by the telephone signal transceiver; an ARS memory 307 for storing automatic voice message to be output via the telephone signal transceiver 301; a voice signal processor 309 for processing voice information signal received by the telephone signal transceiver; a voice card interface 313 for outputting the voice information signals processed by the voice signal processor 309 to an interface means of the voice card 400; and a controller 315 for controlling each constituent.

**[0036]** According to an embodiment of the present invention, the voice recording apparatus 300 further comprises a telephone signal switch 302. The telephone signal switch 302 is connected directly to the telephone line and switches the input signals from the telephone line to the telephone signal transceiver 301 or to a separate telephone of the administrator. In other words, the telephone signal switch 302 connects the telephone signals received from the telephone line to the telephone of the administrator to directly communicate with the administrator, or connects to the telephone signal transceiver 301 to process the telephone signals by the voice recording apparatus.

**[0037]** In addition, the voice recording apparatus according to the present invention further comprises a DTMF generator 305 for generating DTMF signals to be outputted through the telephone signal transceiver 301. DTMF generator 305 can be used to transfer the voice information signals from the voice card connected to the voice recording apparatus of the sender to the remote voice recording apparatus of the receiver according to another aspect of the present invention. It will be mentioned in detail later.

**[0038]** The voice signal processor 309 carries out voice signal processing such as noise reduction, volume adjustment, effect processing, and automatic gain control for the voice information signals. According to the preferred embodiment of the present invention, the voice signal processor 309 make the voice recording apparatus record a volume adjusted and automatic gain controlled voice information signals to the voice card 400 by performing volume adjusting and automatic gain controlling of the voice information signals. Then, the voice card 400 do not have to do separate voice signal processing such as volume adjusting or automatic gain controlling when the voice information signals recorded in the memory means is playing. Therefore, the voice card 400 can play the voice information signal having appropriate volume to listen using the playing function of its own without separate hardware for volume adjusting or automatic gain controlling.

[0039] A voice card interface unit 313 transfers and receives the control signals and voice information signals which were processed by the voice information processor from and to the voice card 400. Control signals in which the voice card interface unit 313 transfers to the voice card 400 includes, a record control signal for instructing to the voice card 400 to be the status that the voice information signal can be recorded, and a play control signal for instructing to the voice card to play the voice information signal. Control signals in which the voice card 400 transfers to the voice card interface unit 313 includes, an EOM (end of message) signal for informing to the voice recording apparatus 300 that the voice card 400 cannot record the voice information signals any more. Moreover, voice information signals recorded in the voice card 400 can be transferred to the voice recording apparatus through the voice card interface unit 313. In this case, transferred voice information signal is transferred again to the telephone line through the telephone signal transceiver 301 of the voice recording apparatus 300, received by the remote voice recording apparatus 300, and recorded to the voice card 400 connected to the remote voice recording apparatus 300. Detailed description of the process will follow.

[0040] The voice recording apparatus 300 according to the present invention further comprises a voice information memory 311 for temporarily storing the voice information signals which are processed by the voice signal processor 309. Then, the voice recording apparatus 300 preferably writes the voice information signals to the memory means 405 of the voice card 400 and to the voice information memory 311 simultaneously or separately.

[0041] If a client calls, DTMF tone input from the client through the telephone signal transceiver 301 is inputted to the controller 315 through the DTMF detector 303. The controller 315 transfers an ARS message stored in the ARS memory 307 according to the inputted DTMF tone from the client. Voice signal input from the client is once recorded to the voice information memory 311, and processed by the voice signal processor 309 to have an appropriate volume, etc., and outputted to be recorded to the voice card. Or, it can be recorded to the voice information memory and to the voice card simultaneously after the voice processing by the voice processor 309. In Fig. 2, 'a' indicates the voice signal of the client whose volume is adjusted by the voice card manufacture terminal.

## Voice Card

[0042] Fig. 4 shows the constitution of the voice card in which voice can be recorded using the voice recording apparatus while it is connected to the voice recording apparatus according to an embodiment of the present invention. The voice card can store the recorded voice information signals, and play the recorded voice information signal separately

[0043] As shown in Fig. 4, a voice card 400 according to the present invention comprises an interface means 403 for transferring and receiving control signals and voice information signals from and to the voice recording apparatus 300, a memory means 405 for storing, in response to the control signals inputted through the interface means 403, voice information signals inputted via the interface means 403, a voice play button for starting the play operation of voice information signals recorded in the memory means 405, and a voice playing means for transforming, triggered by the voice play button 407, the voice information signals stored in the memory means 405 and outputting the transformed voice information signals.

[0044] As described above, the voice card 400 according to the present invention is provided with the interface means 403 for transferring and receiving control signals and voice information signals from and to the voice recording apparatus 300, and according to the preferred embodiment of the present invention, the interface means 403 has input and output terminals as listed below.

[0045] REC: record control signal input terminal for controlling to write the voice information signal whose power is adjusted to the voice card by the voice recording apparatus

[0046] EOM: EOM (End Of Message) signal output terminal for reporting to the voice recording apparatus for the end of recording the voice information signal inputted from the voice recording apparatus

[0047] PLAY: playing control signal input terminal for controlling the voice card to play the voice information signals recorded in the voice card

[0048] Analog-IN: voice information signals input terminal for receiving voice information signals whose power is adjusted from the voice recording apparatus

[0049] Vcc: (+) terminal of power supply

[0050] Speaker+: (+) terminal of the output terminal of the voice information signals recorded in the voice card

[0051] Speaker-: (-) terminal of the output terminal of the voice information signals recorded in the voice card

[0052] GND: (-) terminal of power supply or ground

[0053] Now, as an example of the present invention, a voice card of which interface unit 403 has the terminal components described before will be presented. However, the concept and spirit of the invention are not limited to this example.

[0054] In addition, according to the preferred embodiment of the present invention, voice information signals inputted to the interface means 403 are sampled by sampling means before recording to the memory means 405. That is, since voice information signals inputted to the interface means 403 are conventionally analog signals, the signals are converted to a plurality of sampling signals by sampling means. Sampling signals are recorded to the memory means 405.

[0055] In case that the interface means have the terminals described above, the power terminals Vcc and GND are connected to the battery of the voice card itself thus the power of the voice card itself is consumed during the playing operation by the receiver after the voice card storing the voice of the sender is delivered to the receiver. On pushing the voice play button 407, Play terminal is activated, the voice signals recorded in the memory means 405 is outputted to the Speaker + and Speaker - terminals, and the voice signal is played as a voice by the voice playing means connected to the Speaker + and Speaker - terminals.

[0056] Figs. 9 – 11 show a perspective view, a front view and a rear view of the voice card according to an embodiment of the voice card respectively.

[0057] As shown in Figs. 9 –11, voice card according to an embodiment of the present invention has a hexahedron frame of thin plate shape having a front side 903 and a rear side 905 of rectangular shape and the other four narrow sides. It is desirable to form a groove 909 on the front side 903 or the rear side 905 so that the voice playing means can be inserted while being exposed. Then, the voice playing means 409 is fixed to the inserting groove 909. A groove 911 for fixing power supply means is formed inside of the frame 901. Power supply means are placed inside the frame 901 parallel to the voice playing means 409

by being fixed to the groove 911. Then, the whole thickness of the frame 901 can be made thin. In addition, the frame 901 has a groove for fixing the voice play button 407 to expose to the outside. The voice play button 407 is preferably exposed at the position in which the user can easily operate. The Frame 901 also has a groove for placing a circuit board in which the interface means 403, the memory means 405 and the sampling means are formed. According to the preferred embodiment of the present invention, the interface means 403, the memory means 405, and the sampling means are integrated on a single circuit board and the so-formed circuit board is fixed to the groove 915 of the frame. In addition, the frame 901 has a groove 917 in one side of the four narrow sides to expose the interface means. Therefore, the circuit board is fixed to the groove 915 of the frame and exposed to the outside of the frame through the groove 917. Then, the interface means 403 can be connected to the voice card interface means 313 of the voice recording apparatus 300 when the voice card 400 is connected to the connecting port of the voice recording apparatus 300.

#### Operation of Voice Information Recording to the Voice Card Using the Voice Recording Apparatus

[0058] Now, the process of recording voice information to the voice card as shown in Fig. 4 using the voice recording apparatus according to the present invention as shown in Fig. 3 is described.

[0059] As shown in Fig. 3, the voice recording apparatus according to the present invention is connected to the telephone line and the telephone of the administrator. Moreover, though it is not shown in Fig. 3, according to an embodiment of the present invention, the voice recording apparatus has a Receive Message Record button, Copy button and Input Voice Record button. In response to turn "ON" of the above-mentioned buttons, the voice recording apparatus records a received voice, copies the voice signal recorded in the voice information record memory to the memory means 405 of the voice card, and records a directly inputted voice. The administrator can control the voice recording apparatus by pressing the button corresponding to desired operation.

[0060] Now, Receive Message Record function whose operation is started when Receive Message Record is pressed is explained. This function is to record the transferred voice from the user through the telephone line to the voice information record memory 309

of the voice recording apparatus or to the memory means 405 of the voice card connected to the voice recording apparatus.

[0061] First, a user calls to the administrator's telephone. The administrator answers the phone and communicates with the user. The administrator confirms that the user wishes to record voice, and presses the Receive Message Record button. Then, the voice recording apparatus performs the Receive Message Record function as will be described below. Now, Receive Message Record function is described in more detail referring Fig. 5.

[0062] The voice recording apparatus switches, in response to turning 'ON' of the Receive Message Record button, the call from the user, which was connected to the administrator's telephone, to the telephone signal transceiver 301 of the voice recording apparatus (501). Then, the voice recording apparatus outputs the first ARS message recorded in the ARS memory 307 to the telephone line through the telephone signal transceiver 301 (503). The first ARS message is preferably to instruct to the user to press a predetermined key of the user's telephone. An example of the first ARS message is, to press record key, e.g. '1' for recording, press confirmation key, e.g. '2' for confirmation, and press finish key, e.g. '3' for finishing.

[0063] The voice recording apparatus 300 waits until the DTMF detector 303 detects a predetermined key tone among the telephone signal transferred from the user via the telephone signal transceiver 301 (505). Then, the voice recording apparatus performs the function in which the detected tone indicates: voice recording function is performed if the detected tone is record key, e.g. '1'; playing function is performed if the detected tone is confirmation key, e.g. '2'; finishing function is performed if the detected tone is finish key, e.g. '3' (507).

[0064] Now, voice recording operation, which is performed when the detected tone by the DTMF detector 303 is record key, e.g. '1', is described in detail.

[0065] If the record key, e.g. a dial tone of '1' is detected by the DTMF detector 303, the voice recording apparatus outputs the second ARS message recorded in the ARS memory to the telephone line via the telephone signal transceiver 301 (509). The second ARS message is preferably to instruct to the user to speak the message to be recorded to the user's telephone after the predetermined confirmation sound is heard. The example of the



second ARS message is to instruct to speak the message to be recorded after the “beep” sound.

[0066] Then, the voice recording apparatus generates and outputs the predetermined confirmation sound, i.e. “beep” sound to the telephone line through the telephone signal transceiver 301 (511). Or, the voice recording apparatus may output the confirmation sound, i.e. “beep” sound recorded in the ARS memory. Or, it is possible to generate confirmation sound by generating pulses of constant period from the controller 315 of the voice recording apparatus and outputting the pulses to the telephone line through the telephone signal transceiver 301.

[0067] After that, the voice recording apparatus extracts the voice information signals from the signals transferred through the telephone line, suitable voice processing is performed to the voice information signals by the voice information signal process 309, and the voice information signal is recorded to the voice information record memory 311 (513).

[0068] Or, the voice recording apparatus can record the processed voice information signal by the voice information signal process 309 directly to the voice card through the voice card interface means. In this case, the voice recording apparatus preferably send a control signal REC to instruct to write the voice information signals to the voice card 400 to make the voice card 400 to be a status that can record the voice information signals. Then, the voice recording apparatus sends the voice information signals to the voice card through the voice card interface unit 313, and the voice card writes the voice information signals to the memory means 405. Here, according to the embodiment having interface means 403 of the voice card having the above described terminal configuration, the voice recording apparatus activates REC terminal for controlling to write the voice signals, and inputs the voice information signals processed by the voice signal process 309 to the voice card 400. The voice card 400, in response to the activation of the REC terminal, records the voice information signals inputted to the Analog-In terminal to the memory means 405.

[0069] Here, since the power supply terminals Vcc and GND are connected to the power supply of the voice recording apparatus, the power of the voice card itself is not consumed during recording of the voice information signals. Especially, if the power of the voice recording apparatus is used in the recording process, the battery of the voice card will

be saved because the voltage condition for recording a signal is severer than the one for playing it,

[0070] The step of recording voice information to the voice information memory or the voice card is preferably continued for a predetermined period. Then, after the predetermined period is expired, the voice recording operation stops automatically. Or, the voice card itself informs the finishing of the recording of voice information signals to the voice recording apparatus, and the voice recording apparatus, in response to such information, stops the voice recording operation (515). According to the embodiment in which the interface unit 403 of the voice card has the above-described constitution, the voice card informs that the recording of voice information is finished or the voice card cannot record voice signal any more to the voice recording apparatus via the EOM terminal.

[0071] Now, voice play operation, which is performed when the detected tone by the DTMF detector 303 is confirmation key, e.g. '2', is described in detail.

[0072] If the confirmation key, e.g. a dial tone of '2' is detected by the DTMF detector 303, the voice recording apparatus outputs the voice information signals recorded in voice information memory 311 of the voice recording apparatus to the telephone line via the telephone signal transceiver 301 (519). Or, the voice recording apparatus can output the voice information signals recorded in the memory means 405 of the voice card 400 to the telephone line through the telephone signal transceiver 301.

[0073] Then, the operation performed when the detected tone by the DTMF detector 303 is finish key, e.g. '3', is described in detail.

[0074] If the DTMF detector 303 detects the finish key (521), the voice recording apparatus preferably outputs (523) the third ARS message, which informs that the operation is finished, and finishes the operation (525). Then, the call from the user connected to the telephone signal transceiver 301 is preferably switched to the administrator's phone again to continue to communicate with the user for the administrator.

[0075] Now, the copy operation, which is performed when the copy button of the voice recording apparatus is pressed, is described in detail. The copy operation is recording the voice information signals recorded in the voice information memory 311 of the voice recording apparatus to the memory means 405 of the voice card.

[0076] The administrator presses the copy button of the voice recording apparatus.

[0077] The voice recording apparatus, in response to turning "ON" of the copy button, outputs the voice information signals recorded in the voice information memory 311 to the voice card interface 313.

[0078] The voice information signals outputted to the voice card interface 313 is inputted to the voice card through the interface means 403 of the voice card and recorded to the memory means 405 of the voice card.

[0079] In this case, it is preferable to make the voice card to be a status that can record the voice information signal by sending a control signal instructing to write the voice information signals to the voice card. Then, the voice recording apparatus outputs the voice information signals through the voice card interface 313 to the voice card, and the voice card writes the voice information signals to the memory means 405.

[0080] The step of recording voice information signal to the voice information memory 311 or the memory means 405 of the voice card is preferably continued for a predetermined period. Then, after the predetermined period is expired, the voice recording operation stops. Or, the voice card itself informs the finishing of the recording of voice information signal to the voice recording apparatus, and the voice recording apparatus, in response to such information, stops the voice recording operation.

[0081] Now, the input voice record operation, which is performed when the input voice record button of the voice recording apparatus is pressed, is described in detail. This operation is inputting voice through the microphone connected to the voice recording apparatus, converting the voice to voice information signals and recording to the voice information memory 311 or to the memory means 405 of the voice card.

[0082] The administrator presses the mic button.

[0083] The voice recording apparatus, in response to turning "ON" of the mic button, performs the voice processing to the inputted voice information signals. The voice signal processing includes overall processes such as the volume adjustment enabling the voice card to play the voice appropriately, after the voice information signals are recorded in the memory means of the voice card. Also, it may include the transformation of the voice to the signals fitting to record in the memory for the voice information. Then, the processed

voice information signals are recorded to the voice information memory 311 or to the memory means 405 of the voice card. In this case, it is preferable to make the voice card to be a status that can record the voice information signals by sending a control signal instructing to write the voice information signals to the voice card. Then, the voice recording apparatus outputs the voice information signals through the voice card interface 313 to the voice card, and the voice card writes the voice information signals to the memory means 405.

#### Operation of Voice Information Transmission Using the Voice Recording Apparatus

**[0084]** Now, the case that the voice recording apparatuses 300 of the present invention are equipped in both the first administrator and the second administrator will be presented. The process, recording the voice signal in the voice recording apparatus or the memory means 405 of the voice card of the first administrator's side to those of the second administrator, will be described.

**[0085]** Fig 6 is the block diagram which shows the situation that the voice recording apparatuses and voice cards of the present invention are equipped to both the first administrator part and the second administrator part. When the place of manufacturing the voice card is separated from the place of the receiver of it, the voice card 601 made by the purchaser's voice is connected to the voice recording apparatus 603 of the sender, the voice information signals recorded in the voice card 601 are transferred from the voice recording apparatus 603 of the sender to the voice recording apparatus 605 of the receiver via telephone line, and the voice information signals are recorded in the voice card 607 by the voice recording apparatus 605 of the receiver.

**[0086]** Both the first and the second administration parts, sender and receiver respectively, are equipped with the voice recording apparatuses 300, as shown in the fig 3, and the voice recording apparatus of the sender and the receiver 603 and 605 are connected to the each part's telephone line, respectively. In addition, it is desirable that the voice recording apparatuses of the sender and the receiver 603 and 605 further comprises transmission buttons. In response to turning on the transmission button, the voice information signals recorded in the voice recording apparatus 603 or the voice card 601 of the sender is transmitted to and recorded in the voice recording apparatus 605 or the voice card 607 of the receiver. The description about the operation of the voice recording apparatus 603 and 605 of

the sender and the receiver which is redundant with the explanation referring Figs 3, 4, and 5 will be skipped.

[0087] Now, the process that the voice information signals recorded in the voice recording apparatus of the sender are transmitted to and recorded in the voice recording apparatus of the receiver will be explained referring to the Fig 7. First, the administrator of the sender makes a call to the administrator of the receiver via telephone. Then, during the call is active, the administrator of the receiver presses the transmitted voice recording button of the voice recording apparatus 605 of the receiver if the administrator of the receiver decided to receive the voice information signals from the voice recording apparatus 603 of the sender (703).

[0088] In response to the turning on the transmitted voice recording button of the voice recording apparatus of the receiver, the voice recording apparatus 605 of the receiver switches the call from the sender's telephone to the telephone signal transceiver 301 of the voice recording apparatus of the receiver from the receiver's telephone.

[0089] Subsequently, the voice recording apparatus 605 of the sender outputs the fourth ARS message recorded in the ARS memory 307 to the telephone line via the telephone signal transceiver 301 (705), where the fourth ARS message may be same as the first ARS message as explained before. It is desirable that the fourth ARS message is to ask the administrator of the sender to press the designated key of the sender's telephone. For example of the fourth ARS message, a user may be asked to press the recording key, which is, for instance, key '1' of the user's telephone, to record a message, the confirmation key, key '2', to confirm a message, the termination key, key '3', to finish the message, and the transmission button to transmit the message.

[0090] Then, the administrator of the sender presses the transmission button in case the administrator wants to transmit. In response to the pressing the transmission button, the voice recording apparatus of the sender is switched to the transmission mode in a predetermined period or immediately. Now, the voice recording apparatus of the sender produces the start of transmission tone with DTMF generator and transmits it to the voice recording apparatus of the receiver (709).

[0091] In response to detecting the start of transmission tone received from the voice recording apparatus 603 by the DTMF detector 303, the voice recording apparatus of



in the voice recording memory 311 or the memory unit 405 of the voice card to the telephone line 801 for a while after or right after sending the confirming transmission tone to the voice recording apparatus 603 of the receiver.

[0094] The voice recording apparatus of the receiver records the received voice information signals in the voice recording memory after the voice processing by the voice processor 309.

[0095] It is advisable for the process of recording the voice information signals from the voice recording apparatus of the first administrator into the voice information memory or the voice card to continue for a while. In this case, the voice recording is automated to terminate itself after a while. Or, once the voice recording apparatus of the second administrator is informed of finishing the recording process by the voice card, then terminate the voice recording process 515 in response to such information. In addition, the voice recording apparatus of the second administrator may send the termination of receiving tone to the voice recording apparatus of the first administrator right after the termination of the voice recording process, then have the voice recording apparatus of the first administrator terminate the transmission.

#### Industrial Applicability

[0096] As explained above referring Figs. 2, 3, 4, and 5, since the voice card of the present invention records the user's voice signal with the separate voice recording apparatus and the voice recording apparatus performs the volume adjustment, the volume adjustment function is not required in the voice card only. Therefore, the voice card may be equipped with the switch for playing, not for recording.

[0097] The effect of the present invention is accompanied with the fact that the voice card uses the power of the voice recording apparatus in the voice signal recording process so that the power condition of the voice card can be more flexible. Accordingly, the power of the voice card of the present invention lasts longer than that of the conventional voice card does.

[0098] In addition, in case of recording the voice signal in the voice card using the voice recording apparatus of the present invention, a separate device is used to record the user's voice signal in the voice card. Hence, the number of passive devices required to the voice card is decreased because the volume adjustment unit is not necessary in the voice

card, which results in the decrease of the manufacturing cost. Also, this feature of the present invention enables the voice card not to use the power of itself in the recording process and make it flexible for the user to order the voice card remotely and to deliver it to the receiver.



WHAT IS CLAIMED IS:

1. An apparatus for recording voice information signal on a separate voice card having voice information storing means and interface means, comprising:
  - a telephone signal transceiver for transferring and receiving telephone signals from and to a telephone line;
  - a Dual Tone Multiple Frequency (DTMF) signal detector for detecting DTMF signals among signals received by said telephone signal transceiver;
  - an Automatic Voice Response System (ARS) memory for storing automatic voice message to be output via said telephone signal transceiver;
  - a voice signal processor for processing voice information signal received by said telephone signal transceiver;
  - a voice card interface for outputting the voice information signals processed by said voice signal processor to said interface means of said voice card; and
  - a controller for controlling each of said constituents.
2. The apparatus of claim 1, in which said telephone signal transceiver is connected to an input terminal, and in which said apparatus further comprising a telephone signal switching unit, which is connected to said telephone line, for switching the signal inputted from said telephone line to a separate administrator's telephone or said input terminal.
3. The apparatus of claim 1, further comprising a DTMF generator for generating a DTMF signal to be outputted via said telephone signal transceiver.
4. The apparatus of claim 1, further comprising a voice information memory for temporarily storing the voice information signal processed by said voice signal processor.
5. The apparatus of claim 3, further comprising a voice information memory for temporarily storing the voice information signal processed by said voice signal processor.
6. The apparatus of claim 1, in which said voice signal process performs volume-adjusting process to said voice information signal.
7. The apparatus of claim 1, further comprising a power supply unit for supplying electrical power to said voice signal processor and said controller, and in which said power supply unit supplies electrical power to said voice card.

8. The apparatus of claim 1, further comprising a input means for inputting control signal to said controller, and in which said ARS memory stores a first voice message for requesting to transfer a predetermined dial tone through said telephone line if a user wishes to record a voice message to said voice card and a second message for requesting to transfer the voice information signals to be recorded to said voice card after said a first confirmation sound is heard, and said controller performs the steps of:

(a) controlling said ARS memory and said telephone signals transceiver, in response to a first control signal being inputted via said input means, to output said first voice message which is recorded in said ARS memory through said telephone signals transceiver;

(b) waiting for a predetermined dial tone to be received by said telephone signal transceiver for a first period;

(c) controlling said ARS memory and said telephone signal transceiver, in response to the receipt of the predetermined dial tone through said telephone signal transceiver, to output said second voice message to said telephone line through said telephone signal transceiver;

(d) controlling said telephone signal transceiver to generate signals corresponding to said first confirmation sound and output said first confirmation sound to said telephone line through said telephone signal transceiver;

(e) waiting for a second period; and

(f) recording the voice information signals extracted from said telephone signals received from said telephone line through said telephone signal transceiver to said memory means of said voice card.

9. The apparatus of claim 8, in which said ARS memory stores voice information signals corresponding to said first confirmation sound, and said (d) step generating signals corresponding to said first confirmation sound and outputting said first confirmation sound to said telephone line, is controlling said telephone signal transceiver and said ARS memory to output said voice information signals corresponding to said first confirmation sound stored in said ARS memory to said telephone line through said telephone signal transceiver.

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(e1) extracting voice information signals from said telephone signal received from said telephone line through said telephone signal transceiver, voice processing said voice information signals by said voice signal processor, and recording said voice information signals to said memory means of said voice card;

(a2) controlling said DTMF generator and said telephone signals transceiver, in response to said second control signal being inputted through said input means, to generate said first tone informing start of transmission by said DTMF generator and to output said first tone to said telephone line through said telephone signal transceiver;

(b2) waiting for said second tone informing start of receiving to be detected among said telephone signal received through said telephone signal transceiver; and

(c2) controlling said interface means of said voice card and said telephone signal transceiver, in response to said second tone being detected by said DTMF detector, to output voice information signals recorded in said voice card to said telephone line through said telephone signal transceiver.

14. The apparatus of claim 3, further comprising an input means for inputting control signals to said controller, said ARS memory stores a first voice message, and said controller performs the steps of:

(a1) controlling said ARS memory and said telephone signals transceiver, in response to a third control signal being inputted through said input means, to output said first voice message recorded in said ARS memory to said telephone line using said telephone signals transceiver;

(b1) waiting for a first tone informing start of transmission to be detected by said DTMF detector;

(c1) controlling said DTMF generator and said telephone signal transceiver, in response to said first tone being detected by said DTMF detector, to generate a second tone informing start of receiving by said DTMF generator and to output said second tone to said telephone line through said telephone signal transceiver;

(d1) waiting for a third tone confirming of transmission to be detected by said DTMF detector;

(e1) extracting voice information signals from said telephone signals received from said telephone line through said telephone signal transceiver, voice processing said voice information signal by said voice signal processor, and recording said voice information signal to said memory means of said voice card in response to said third tone being detected by DTMF detector;

(a2) controlling said DTMF generator and said telephone signals transceiver, in response to said second control signal being inputted through said input means, to generate said first tone informing start of transmission by said DTMF generator and to output said first tone to said telephone line through said telephone signal transceiver;

(b2) waiting said second tone informing start of receiving to be detected among said telephone signal received through said telephone signal transceiver;

(c2) controlling said DTMF generator and said telephone signal transceiver, in response to said second tone being detected by said DTMF detector, to generate said third tone by said DTMF generator and to output said third tone to said telephone line through said telephone signal transceiver; and

(d2) controlling said interface means of said voice card and said telephone signal transceiver to output voice information signals recorded in said voice card to said telephone line through said telephone signal transceiver.

15. The apparatus of claim 5, further comprising an input means for inputting control signals to said controller, said ARS memory stores a first voice message, and said controller performs the steps of:

(a1) controlling said ARS memory and said telephone signals transceiver, in response to a third control signal being inputted through said input means, to output said first voice message recorded in said ARS memory to said telephone line using said telephone signals transceiver;

(b1) waiting for a first tone informing start of transmission to be detected by the DTMF detector among said telephone signal received through said telephone signal transceiver;

(c1) controlling said DTMF generator and said telephone signal transceiver, in response to said first tone being detected by said DTMF detector, to generate a

second tone informing start of receiving by said DTMF generator and to output said second tone to said telephone line through said telephone signal transceiver;

(d1) waiting for a predetermined period;

(e1) extracting voice information signals from said telephone signals received from said telephone line through said telephone signal transceiver, voice processing said voice information signal by said voice signal processor, and recording said voice information signal to said voice information memory;

(a2) controlling said DTMF generator and said telephone signals transceiver, in response to said second control signal being inputted through said input means, to generate said first tone informing start of transmission by said DTMF generator and to output said first tone to said telephone line through said telephone signal transceiver;

(b2) waiting for said second tone informing start of receiving to be detected by said DTMF detector in said telephone signal received through said telephone signal transceiver; and

(c2) controlling said voice information memory and said telephone signal transceiver, in response to said second tone being detected by said DTMF detector, to output voice information signals recorded in said voice information memory to said telephone line through said telephone signal transceiver.

16. The apparatus of claim 5, further comprising an input means for inputting control signals to said controller, said ARS memory stores a first voice message, and said controller performs the steps of:

(a1) controlling said ARS memory and said telephone signals transceiver, in response to a third control signal being inputted through said input means, to output said first voice message recorded in said ARS memory to said telephone line using said telephone signals transceiver;

(b1) waiting for a first tone informing start of transmission to be detected by said DTMF detector;

(c1) controlling said DTMF generator and said telephone signal transceiver, in response to said first tone being detected by said DTMF detector, to generate a

second tone informing start of receiving by said DTMF generator and to output said second tone to said telephone line through said telephone signal transceiver;

(d1) waiting for a third tone confirming of transmission to be detected by said DTMF detector;

(e1) extracting voice information signals from said telephone signals received from said telephone line through said telephone signal transceiver, voice processing said voice information signals by said voice signal processor, and recording said voice information signals to said voice information memory in response to said third tone being detected by DTMF detector;

(a2) controlling said DTMF generator and said telephone signals transceiver, in response to said second control signal being inputted through said input means, to generate said first tone informing start of transmission by said DTMF generator and to output said first tone to said telephone line through said telephone signal transceiver;

(b2) waiting for said second tone informing start of receiving to be detected by said DTMF detector among said telephone signal received through said telephone signal transceiver;

(c2) controlling said DTMF generator and said telephone signal transceiver, in response to said second tone being detected by said DTMF detector, to generate said third tone by said DTMF generator and to output said third tone to said telephone line through said telephone signal transceiver; and

(d2) controlling said interface means of said voice card and said telephone signal transceiver to output voice information signals recorded in said voice information memory to said telephone line through said telephone signal transceiver.

17. A voice card for storing and playing voice, comprising:

an interface means for transferring and receiving control signals and voice information signals from and to an external voice recording apparatus;

a memory means for storing, in response to said control signals, voice information signals inputted to said interface means;

a voice play switch; and

a voice playing means for converting, triggered by said voice play switch, the voice information signals stored in said memory means to voice signals and outputting said voice signals.

18. The voice card of claim 17, further comprising:

a sampling means for converting voice information signals to sampling signals by sampling said voice information signals inputted to said interface means; and

in which said memory means stores said sampling signals outputted from said sampling means.

19. The voice card of claim 17, further comprising:

a power supply means for supplying electrical power from said voice recording apparatus to said memory means.

20. The voice card of claim 17, in which said interface means includes means for triggering said voice playing means to convert voice information signals recorded in said memory means to voice signals and to output said voice signals.

21. The voice card of claim 17, in which said interface means includes means for informing that said memory means cannot record voice information signals any more to said voice recording apparatus.

22. The voice card of claim 19, further comprising:

a substrate for forming said interface means, said voice play switch and said memory means thereon;

a frame for fixing said voice playing means, said power supply means and said substrate thereto;

in which said frame has a thin plate shape having a first and a second rectangular faces and four lateral faces;

the first face has an inserting groove for inserting a voice playing means while exposing said voice playing means;

said frame has a groove for fixing said power supply means parallel to said inserting groove inside of said frame;

said frame has a groove for fixing said substrate adjacent to one of said four lateral faces inside of said frame;



said one of said four lateral faces adjacent to said groove for fixing said substrate has a hole to expose said interface means formed on said substrate to the outside of said frame; and

one of said six faces has a hole to expose said voice play switch to the outside of said frame.

## **VOICE RECORDING APPARATUS, VOICE CARD, AND METHOD FOR RECORDING VOICE BY USING THEM**

### Abstract of the Disclosure

Disclosed is an apparatus for recording voice information signal on a separate voice card having storing means and interface means. The apparatus comprises: a telephone signal transceiver for transferring and receiving telephone signals from and to a telephone line; a Dual Tone Multiple Frequency (DTMF) signal detector for detecting DTMF signals among signals received by the telephone signal transceiver; an Automatic Voice Response System (ARS) memory for storing automatic voice messages to be output to the telephone signal transceiver; a voice signal processor for processing voice information signals received by the telephone signal transceiver; a voice card interface for outputting the voice information signals processed by the voice signal processor to an interface means of the voice card; and a controller for controlling each constituent. The voice recording apparatus further comprises: an input means for inputting control signal to the controller.

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FIG. 1

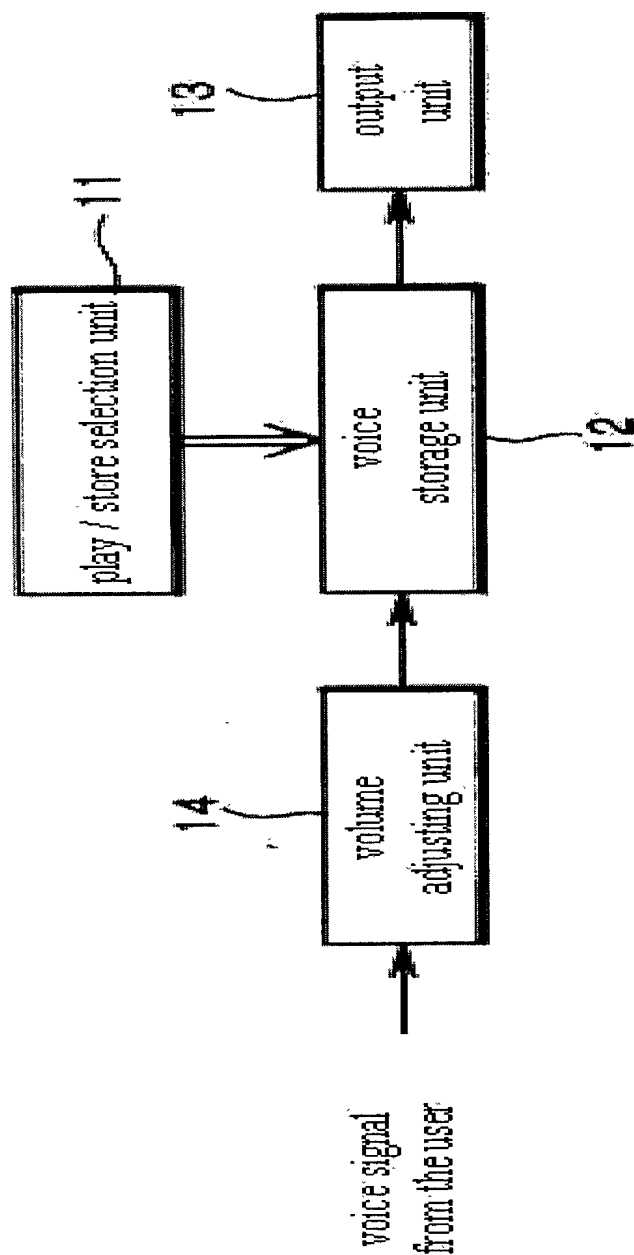


FIG. 2

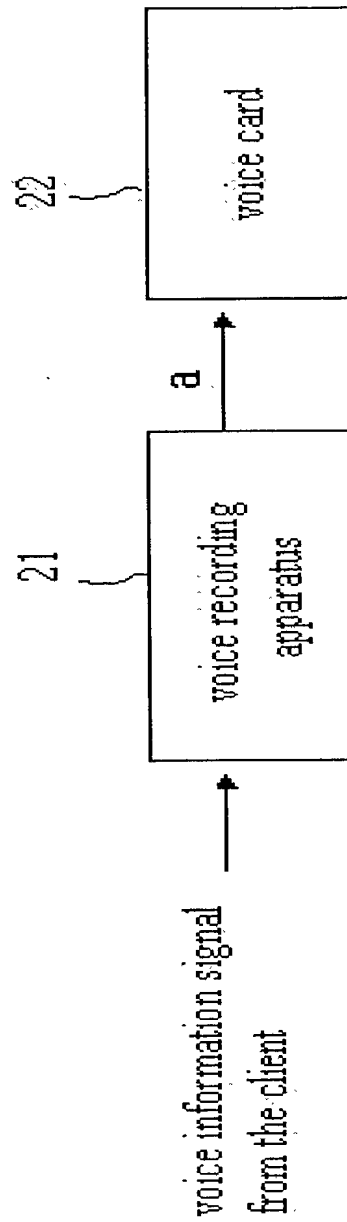




FIG. 4

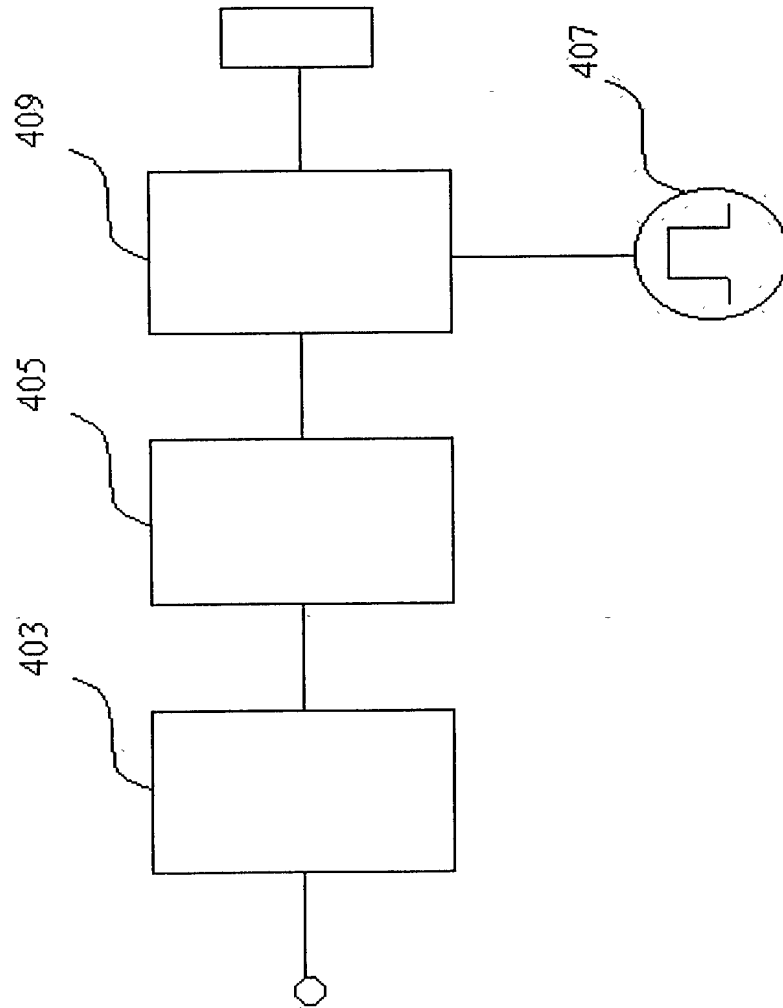


FIG. 5

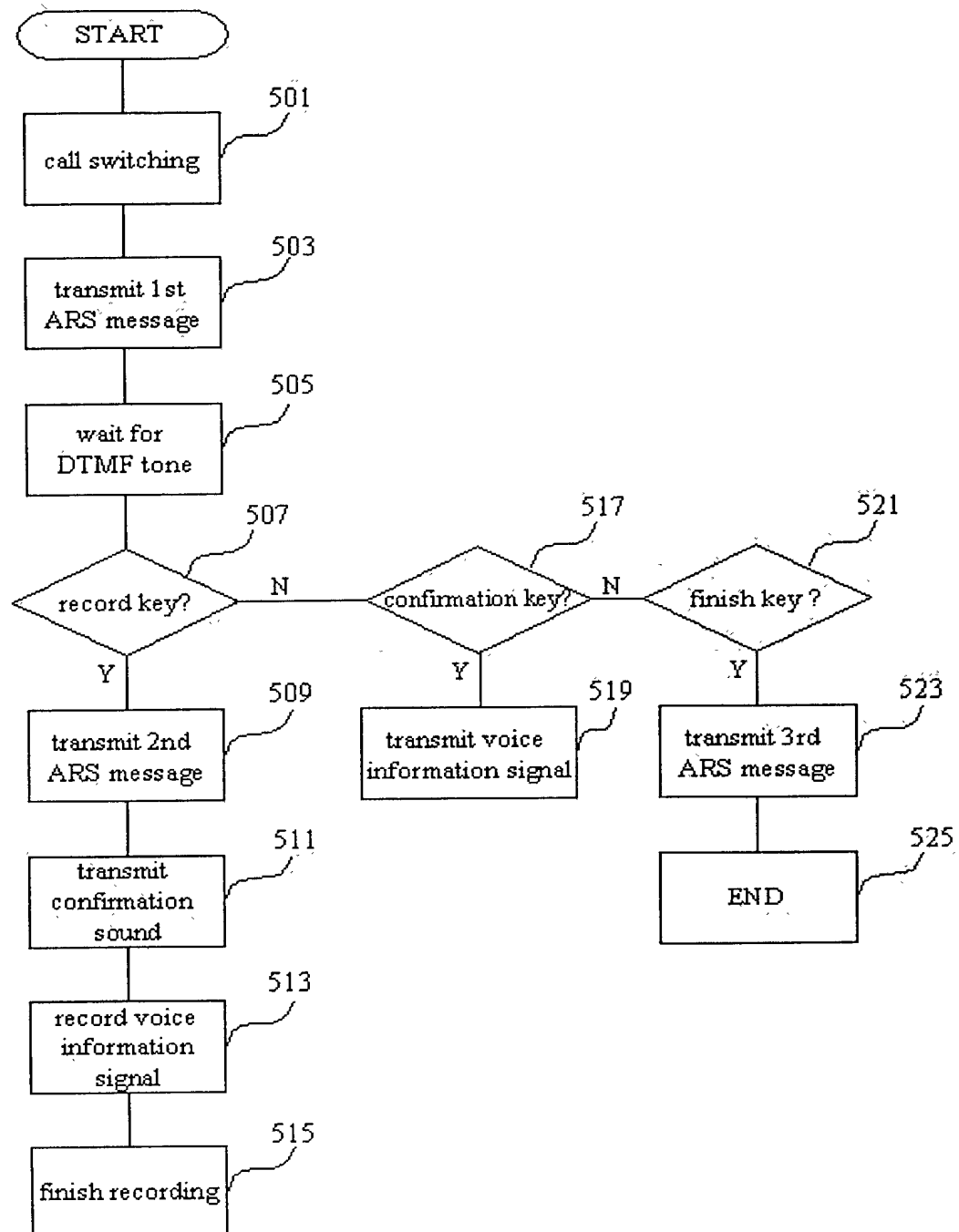


FIG. 6

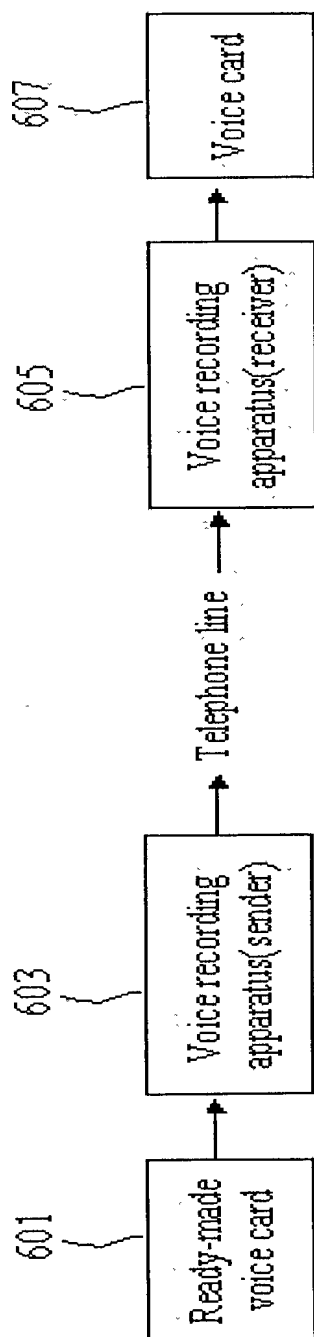




FIG. 7

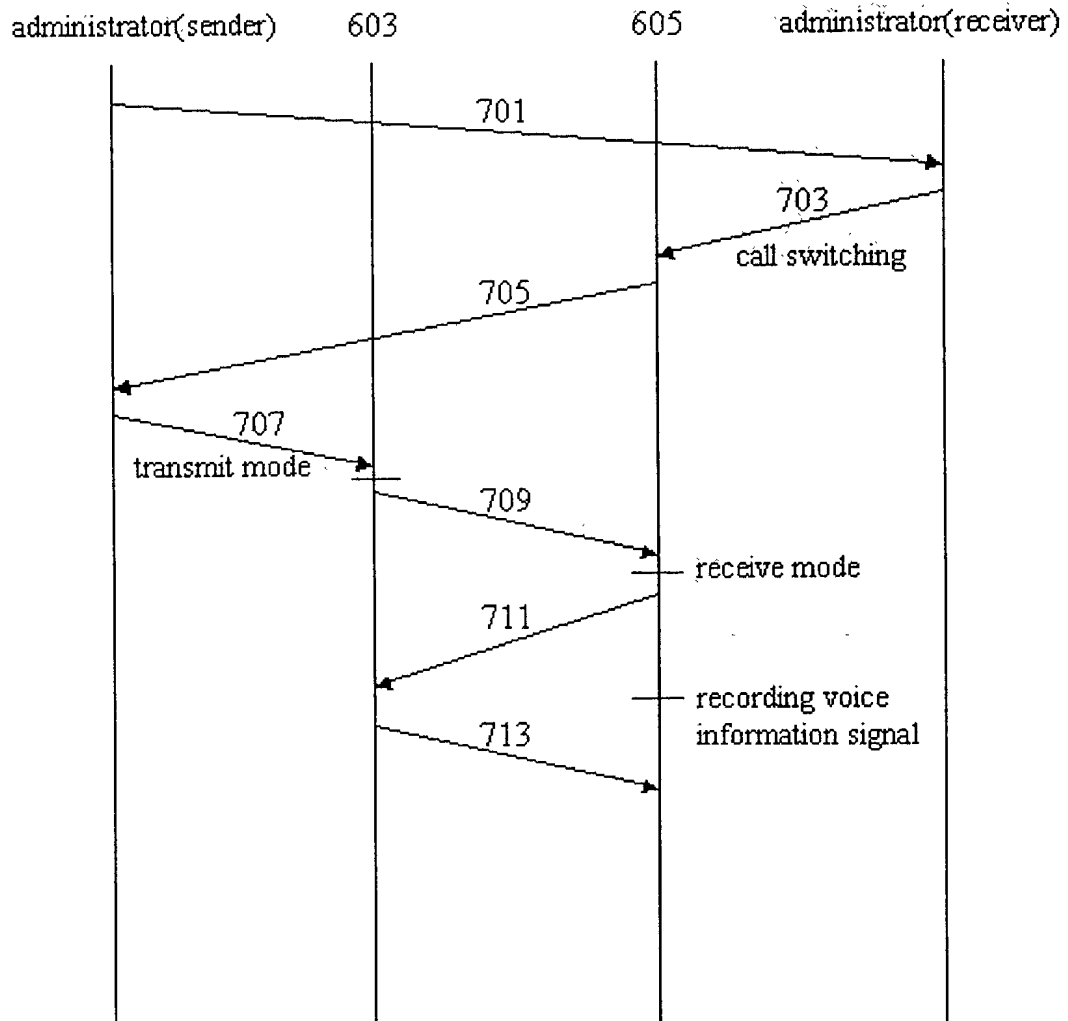
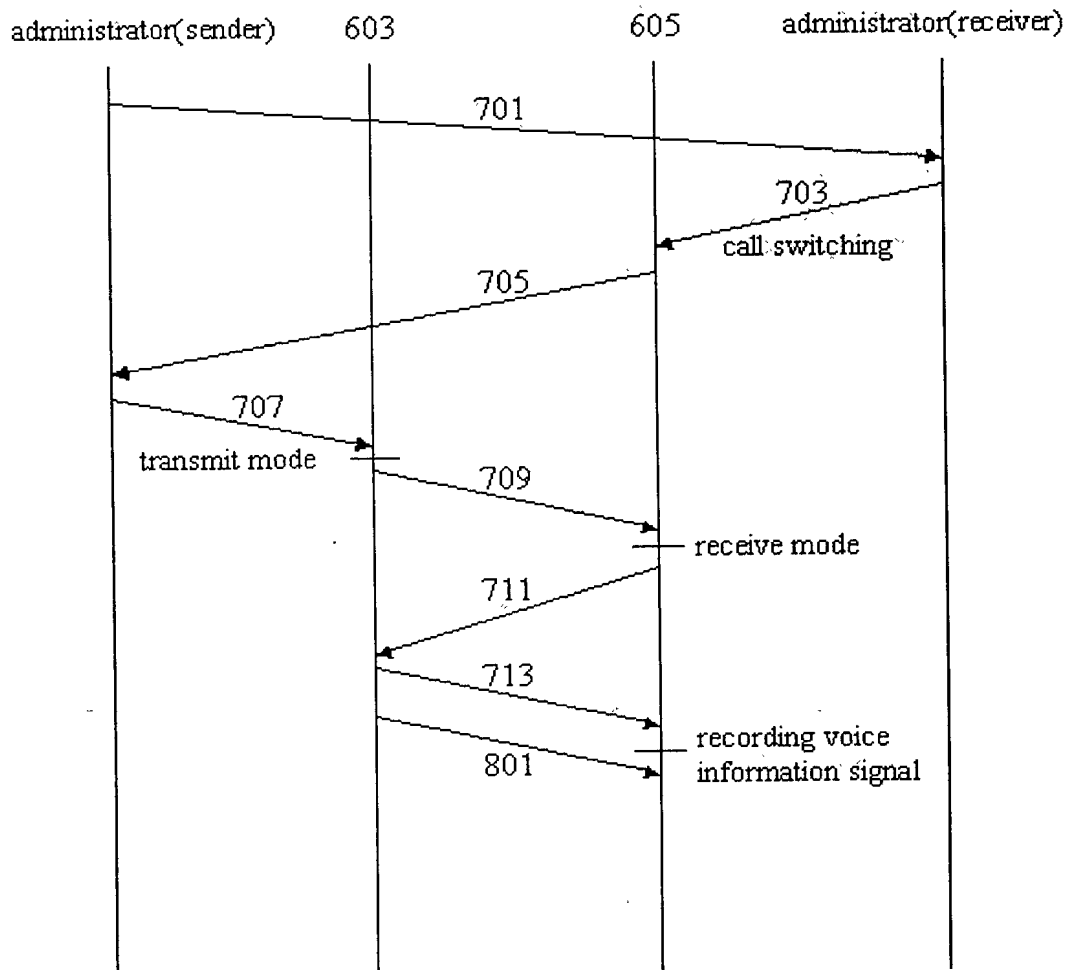


FIG. 8



**DECLARATION - USA PATENT APPLICATION**

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name;

I believe I am an original, first and joint inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled **VOICE RECORDING APPARATUS, VOICE CARD, AND METHOD FOR RECORDING VOICE BY USING THEM** the specification of which was filed September 28, 2000 as International Application No. PCT/KR00/01082, published August 9, 2001 as WO 01/57644 A1, and filed as Application No. 09/914829;

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above;

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, § 1.56;

I hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent, design or inventor's certificate or any PCT international application(s) listed below and have also identified below any foreign application(s) for patent, design or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed for the same subject matter having a filing date before that of the application(s) of which priority is claimed:

**PRIOR FOREIGN APPLICATION**

COUNTRY	APPLICATION NUMBER	DATE OF FILING	PRIORITY CLAIMED UNDER 37 U.S.C. § 119
KOREA	1999/57007	December 13, 1999	YES

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful, false statements may jeopardize the validity of the application or any patent issued thereon.

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